public interest ADVOCACY CENTRE

# Post-2025 Market Design Consultation Paper

**30 October 2020**

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## About the Public Interest Advocacy Centre

The Public Interest Advocacy Centre (PIAC) is an independent, non-profit legal centre based in Sydney.

Established in 1982, PIAC tackles barriers to justice and fairness experienced by people who are vulnerable or facing disadvantage. We ensure basic rights are enjoyed across the community through legal assistance and strategic litigation, public policy development, communication and training.

## Energy and Water Consumers' Advocacy Program

The Energy and Water Consumers' Advocacy Program (EWCAP) represents the interests of low-income and other residential consumers of electricity, gas and water in New South Wales. The program develops policy and advocates in the interests of low-income and other residential consumers in the NSW energy and water markets. PIAC receives input from a community-based reference group whose members include:

- NSW Council of Social Service;
- Combined Pensioners and Superannuants Association of NSW;
- Ethnic Communities Council NSW;
- Salvation Army;
- Physical Disability Council NSW;
- Anglicare;
- Good Shepherd Microfinance;
- Financial Rights Legal Centre;
- Affiliated Residential Park Residents Association NSW;
- Tenants Union;
- The Sydney Alliance; and
- Mission Australia.

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The Public Interest Advocacy Centre office is located on the land of the Gadigal of the Eora Nation.

# Contents

# 1. Introduction

PIAC welcomes the opportunity to respond to the Energy Security Board's (ESB) Post 2025 Market Design Consultation Paper.

The National Energy Market (NEM) is in a transformation, from an energy system relying primarily on large scale, centralised, firm, mechanical, fossil-fuel generation and passive demand, to one with a small scale, decentralised, variable, electronic, low-emission generation fleet interacting with more sophisticated and active demand-side behaviour.

The rapid transition in energy and resources presents challenges and opens potential opportunities to create more sustainable and prosperous communities.

Real electricity prices have increased for households, becoming a major cost of living pressure. This has exacerbated energy poverty and left many people without an essential service – with impacts on their health, wellbeing and options for improving their circumstances.

Against this backdrop, emissions reduction and economic opportunity have often been framed as in opposition, and the energy industry has been subject to major upheaval and policy uncertainty in a decade of political volatility.

PIAC considers, aside from the absence of an enduring emissions policy, the current wholesale energy market arrangements worked well until, and for the most part including, the past decade. Since then, signals for investing in, operating and co-optimising generation, networks and demand-side resources have become increasingly inefficient. Market arrangements are not 'broken', but neither are they fit for the purpose of resolving the energy trilemma in the coming decade and beyond.

Fundamental change to energy markets, and the planning and operation of the energy system, is required to ensure energy supply remains reliable, becomes affordable, and emissions reductions are made at the optimal rate.

Identifying and managing the risks and opportunities of the changing energy system so it can deliver the most efficient, affordable, sustainable balance of supply and demand resources for consumers should be the central goals of the ESB's Post-2025 work.

To achieve this, the ESB should be guided by principles focused on consumer preferences and interests.

# 2. Assessment Framework

PIAC supports the ESB's proposed key principles with some modifications, particularly with respect to cost allocation and emissions reduction.

## Cost allocation

In PIAC's view, the criteria 'costs and risks … should rest with those parties best-placed to manage them' does not efficaciously promote the National Energy Objective (NEO).

Passive energy users and critical loads are limited in being able to respond to certain costs, but that does not mean the cost of supplying them should not be allocated to them. Similarly, an active energy user who provides benefit to the wider market would be expected to be rewarded for their actions.

PIAC suggests replacing this cost principle with the more efficient and fairer 'beneficiary-pays' principle, so that 'costs are allocated to those who benefit from a given investment or action'.

Under this principle:

- Where there are multiple beneficiaries, the costs should be recovered proportionally to their share of the benefits.
- Where it is not practical and transparent to identify the beneficiaries and measure the benefits, a causer-pays approach should be used.
- Cross-subsidies should only be permitted where they are accepted by informed consumer preferences of those paying for that subsidy, or where they are immaterially small.

## Emissions reduction principle

PIAC notes the ESB includes a 'supports lower emissions' principle in its Stage Two but not Stage One assessment principles. PIAC recommends including emissions reduction as an assessment principle in Stage One, from the outset of the market design process.

Reducing emissions efficaciously is in the long-term interests of consumers. Including an emissions reduction principle in stage one assessment criteria avoids any misalignment of objectives between stages and ensures any market design delivers fast decarbonisation at least cost.

## Transparency and simplicity principle

PIAC recommends including transparency as a stand alone assessment principle, and simplicity as a subordinate principle that promotes efficiency and fairness. We consider simplicity is important, especially in consumer-facing aspects of the Post-2025 market, such as the two-sided market and Distributed Energy Resources (DER) integration, however, energy market design has inherent complexities which should be preserved where they result in efficiency and fairness. Transparency is a prerequisite for an efficient and fair market design and consequently should be included as an assessment criteria.

## The use of customer archetypes or outcomes to inform evaluation

Sections 3.3 and 3.4.2 of the ACOSS-led joint consumer submission, to which PIAC is a signatory, welcomes the ESB's use of consumer archetypes. We diverge from this position in this submission, recommending the ESB instead take an approach that focusses on consumer outcomes, as follows.

PIAC supports ESB assessing how 'different aspects of the reform program might work in practice with different customer groups' however, suggests the ESB moves from using archetypes.

Archetypes can be a distraction – or worse, counterproductive – when trying to design energy market and system arrangements to meet the needs and preferences of the broader community and the businesses that serve them. Individuals rarely identify meaningfully with archetypes.

While archetypes are of some use in marketing energy services to some consumers, that is not the purpose of the ESB's task.

PIAC recommends to instead consider how various market design options affect consumer outcomes according to people's relative levels of interest in engagement and level of advantage. Compared to the use of archetypes, this approach is simple and inclusive and allows a more realistic and helpful assessment of the likely overall benefits of any particular market design elements.

More details can be found in this approach in our discussion of consumers and the changing energy market in Section 4 below.

### The use of forecasts and scenarios

Forecasts are important tools for predicting the nature, magnitude and timing of emerging needs in the energy market. As the energy system becomes increasingly complex and the pace of change increases, forecasting is becoming more challenging.

PIAC considers the design of future markets should cater to the range of plausible future scenarios and future pricing arrangements should be adaptable to changing and unpredictable conditions and needs.

The use of scenarios that reflect the range of plausible outcomes, rather than single-point forecasts, is appropriate. The ESB outlined its approach to scenarios in the Post-2025 Market Design in earlier stages of the consultation.

In the 2019 Issues Paper, the ESB notes, '[u]nderstanding the relative ability of any particular market design to deliver on the National Energy Objective will require an understanding of the range of future worlds that are likely to exist', and highlights it is likely to use ISP scenarios as it considers them the most comprehensive future scenarios of the NEM.[1]

PIAC would welcome ongoing confirmation of the ESB's approach to forecasting and scenarios.

We recognise the significant challenge of finding a balanced approach to managing the impacts, real and perceived, on incumbent businesses, and the risks of making major reform to an existing energy market. We consider a transparent and consistent approach to scenarios and forecasting

1 ESB, 2019. Post-2025 Market Design Issues Paper. http://www.coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/EC%20-%20Post%202025%20Market%20Design%20Issues%20Paper%20-%2020190902_0.pdf, 10.

across the Post-2025 design process would contribute to de-risking the transition for consumers and businesses.

As well as the assessment criteria outlined in the consultation paper, PIAC is approaching the Post-2025 design process guided by its established vision and priorities for how the energy system should operate to serve consumers. This approach has been refined over the past 3 years and builds on the PIAC's energy consumer advocacy since 1998.

# 3. PIAC's energy agenda and priorities

The cost of the energy system has made electricity increasingly unaffordable for households, leaving many people going without an affordable essential service. Simultaneously, the risks of climate change have accelerated the need to decarbonise the energy system and make it more resilient.

In light of these conditions, PIAC has the following goals:

- NSW household energy bills are 25 per cent lower than 2017-18 levels by 2025, while maintaining a resilient energy system and continual reductions in emissions.
- Outcomes from energy policies, systems and markets reflect consumer preferences and interests such that:
    - **Essential energy needs** are met with efficiently priced, simple, and accessible products and services that do not require active participation in energy markets. Supporting frameworks and protections are in place to limit disadvantage in accessing these products and services, and
    - **Flexible energy uses** are met with products and services that reward participants for contributing to a more dynamic and efficient energy system, to the benefit of all energy users through co-optimised demand and supply.

All energy needs default to being essential. People - not energy providers, or market institutions - chose which, if any, of their own energy uses are flexible. Reforms such as the two-sided market reforms should seek to remove barriers to participation for flexible energy uses, without complicating people's access to basic products and services for their essential energy needs.

To achieve these goals PIAC focusses on markets, networks, assistance, energy choice, and support policies. We describe our priorities in these areas below.

### Market outcomes

In markets, effective competition delivers meaningful choice for consumers and more affordable energy services, ensuring the transition to the future energy system is sustainable and fair.

- All retail consumers get a fair deal for essential energy services and the choice to access a range of options for delivery, without being disadvantaged by the choice not to participate.
- The wholesale market reflects the changing physics and needs of the energy system, including access to demand side options for all types of consumers, a clear transition plan to a clean energy system, pricing services and outputs such as inertia and carbon intensity according to their cost or value, and resilience to the exit of existing generators.

- Market costs are recovered from those who benefit from them and risks sit with those best placed to manage them.

**Network efficiency and reliability**

Energy networks are efficient, underpinned by transparent decision making and effective regulation.

- The regulator is expert and strong, with the power and resources to do its job. Its decisions bind and, if challenged, should be subject to a balanced appeals process.
- All decisions that affect consumers are underpinned by consumer preferences established through effective engagement and quality research.
- The cost of new investment in networks is recovered on a beneficiary-pays basis and the risks sit with those best placed to manage them.

**Assistance**

Effective payment assistance and other measures are available to those who need support, to ensure continued affordable, equitable access to energy and water services while avoiding disconnection and debt accumulation.

- No-one loses access to their essential services because they are unable to pay.
- Assistance and supports have transparent objectives that enable ongoing assessment of their effectiveness.
- People are aware of available assistance and the obligation for it to be offered.

**Energy choice**

All households and other consumers have the option to choose how they use, generate and store energy.

- Consumers are not disadvantaged based on their option for access, or on whether they choose not to participate in any particular way.
- For consumers of distributed energy resources, there are protections commensurate with the potential level of harm.
- Support for more efficient and effective home energy options is targeted at those otherwise unable to access these tools.

**Supporting policies**

Non-energy specific policies, such as building and appliance standards, health, data and transport, maximise efficiency and contribute to reliable, affordable and sustainable energy supply and consumption that supports the health, wellbeing and opportunity of NSW households.

- A whole of economy and society energy strategy is implemented that includes climate response and leaves no-one behind, including renters, remote communities and other potentially vulnerable households.

# 4. A holistic view of consumers

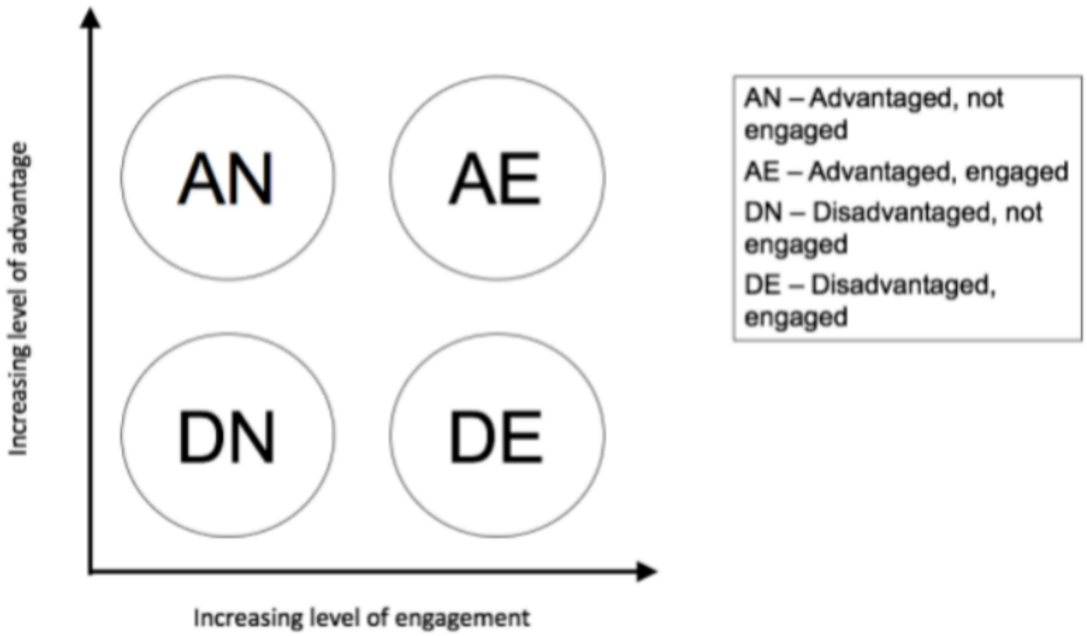
## 4.1 Consumers and the changing energy market

Until about a decade ago, energy consumers across Australia could very broadly be categorised by their level of social advantage into 'haves' and 'have nots': they could either afford energy, and the tools to limit their usage if they so desired, or they could not.

Since then, deregulation, emergence of contestability, innovation of behind-the-meter energy technology, and escalation of energy prices have created the need for consumers to be thought of differently to just these two groups: in addition to social advantage, a consumer's level of engagement with the energy market now has a material impact on their energy outcomes.

PIAC considers consumer outcomes, including from consumer protections and market design, are influenced by two measures: a consumer's level of engagement and advantage (see Figure 1)

***Figure 1: Consumer engagement vs advantage***




An engaged consumer who is socially advantaged (they own their own home and have sufficient income) may be able to minimise their energy bills through a combination of changing retail contracts, ongoing engagement in the form of paying their bills on time to access discounts, physical and behavioural energy efficiency options and behind-the-meter technologies. A consumer that is not engaged, or is financially disadvantaged, is likely to consume more energy from the grid, purchased from a retailer to whom they pay a higher price by not accessing the cheapest deals.

**Advantaged/able, not engaged (AN)**

This group is disengaged from the energy market. While they do experience higher bills through suboptimal retail contracts and a lack of demand side participation, their relative social advantage means they are usually able to withstand the financial detriment associated with these contracts. On the other hand, while these consumers are more able to withstand the detriment associated with their lack of engagement, they still experience inefficiently high bills in a way their engaged counterparts do not. Many are at risk of falling into the DN group if their circumstances change, and consumer protections need to cater to this risk.

**Disadvantaged/vulnerable, not engaged (DN)**

This group is likely to have the worst outcomes. The combination of energy market disengagement and relative social disadvantage means that these consumers are unable or unlikely to take advantage of new energy technology or beneficial market contracts from energy retailers. They may use large volumes of high-priced energy that they are unable to afford. Competition frameworks should support them having the opportunity to benefit from engagement, but it is critical that supporting frameworks, including protections and concessions, should not require them to be engaged or assume that is an option for them. The goal should be to move people from the DN cohort to the AN cohort, while giving them the opportunity to move to the AE cohort but not obliging them to do so.

**Advantaged/able, engaged (AE)**

This group is the only one broadly getting good outcomes today. The combination of energy market engagement and relative social advantage means these consumers are likely to be on favourable retail energy contracts, and choose (and can afford) to be adopters of energy technology such as solar PV, energy storage and demand management systems. Competitive opportunities for these consumers should be encouraged, while recognising they are, by and large, least at risk of disadvantage.

**Disadvantaged/vulnerable, engaged (DE)**

While this group still requires similar support to the DN cohort, their willingness to engage means they are able to ameliorate some impacts of disadvantage through engagement with the energy market, if presented with the opportunity to do so. The goal for this group should be giving them the opportunities to benefit from competition and innovation in the same way that the AE cohort has, while affording them the protections available to the DN cohort.

PIAC considers the market design process would benefit from a broader consideration of how levels of disadvantage and nature of engagement affect consumer outcomes under different design options. This approach can assess what consumer benefits are contingent upon, for example level of engagement, and identify the risks these benefits will not be realised and how market design contributes to or mitigates those risks. If beneficial outcomes for any particular consumers are less 'contingent', they are more likely to be widely realised. With this approach, the ESB can assess options for market design likely to maximise overall benefits to consumers more effectively than with its proposed use of archetypes.

## 4.2 The role of competition

The current energy retail market arrangements are predicated on the assumption contestability with limited regulation brings good outcomes for consumers and consumers can and will engage

with the market to maximise value for themselves. In reality, deregulated contestability in retail has not delivered anticipated benefits to the majority of energy consumers and many consumers would strongly prefer not to have to engage with the energy market to just to receive basic energy services at a fair price.

The failure of energy retail price deregulation and the pursuit of contestability for its own sake can be seen most prominently in the large price dispersion historically seen across otherwise undifferentiated energy retail offers. This price dispersion is not justified on the basis of differing costs of supplying energy, and operates as a tax on consumers who are disengaged from the retail market for whatever reason, are unable to pay bills on time (to access pay-on-time discounts) or who cannot switch retailers. Consumers in areas with regulated retail prices, on the other hand, receive the lowest energy prices in the NEM.

The lack of new products and services, such as demand response, offered by energy retailers is also a symptom of the lack of effective competition operating the market.

Contestability with price deregulation in energy retail has inevitably resulted in poor outcomes for a wide range of consumers.  Energy is an essential service that people do not have the choice to consume and so cannot opt-out of the market unless they have the capacity to go fully off-grid. Further, there is little material difference in the underlying products and services being provided by energy retailers so in most cases customers are only engaging as a means to prevent paying too much. The existing energy retail market forces people to engage in order to get a fair price, and punishes people who do not.

The failure of contestability with little or no regulation to deliver benefits to energy consumers is not limited to the energy retail market. History has shown prioritising contestability is not in the best interests of consumers across a number of areas of the energy system.

The introduction of contestability into metering has resulted in the slow and inefficient rollout of smart meters outside of Victoria, limiting access to the new energy technologies and services smart metering can unlock. The AEMC's decision to force the involvement of retailers for customers who are moved onto Stand-Alone Power Systems (SAPS) by their distributor (for the sake of 'competition' and without regard to consumer preferences and outcomes), as well as preventing distributors from providing contestable services such as a SAPS generating asset (despite the value being trivial and there being no other commercial providers), will likely inhibit SAPS being developed where it is efficient to do so. These unnecessary barriers to the development of SAPS will result in higher network costs for all consumers and decreased resilience in the long run. For customers transitioned to SAPS in this way, the requirement to have a retailer may see them forced onto uncompetitive energy deals as few energy retailers are available in the remote areas where SAPS are generally installed, and they are unlikely to make offers to SAPS customers.

The ESB should prioritise competitive outcomes rather than contestability for its own sake in its future market design. This requires

- elements of people's essential energy need not being deregulated for the sake of contestability alone, and

- allowing monopoly businesses to provide contestable services where it leads to better outcomes for consumers.

## 4.3 Consumer willingness to engage

Despite the expectation and pressure on households and other energy users to engage with the energy market, most have shown a strong preference not to, and desire an energy landscape that demands less of their attention. Many remain on non-optimal deals despite being able to switch.

Research from Energy Consumers Australia (ECA) found consumers have limited interest in engaging with energy-related decisions and generally consider a 'better energy future' would be more affordable, simple, easy to manage, clean and inclusive.[2]

Research from Royal Melbourne Institute of Technology (RMIT) and Monash University also found a preference among households for simplicity in energy matters, and dissatisfaction with existing complexity in the energy market, which they considered required them to invest substantial time, skills and interest in a system they doubted was even serving their interests.[3]

However, despite the research showing widespread disengagement, households were not disinterested in energy issues and most householders were interested in participating in energy initiatives which they perceived to be productive – not only for personal gain but to support the energy system.[4]

The report identified two types of disengaged consumer: unengaged and deliberately disengaged. Unengaged households were not particularly interested in tariffs, the energy market or grid technicalities, while those that were deliberately disengaged had decided to disengage due to dissatisfaction, frustration and disappointments with aspects of the energy market. Importantly, the deliberately disengaged consumers were not disinterested in energy issues, rather, they were engaged in other ways such as adopting new technologies, improving their home's energy efficiency performance, ensuring health, comfort and productivity at home, or engaging with energy policy regarding affordability, reliability and environmental impacts.[5]

These findings provide useful information for consumer-facing elements of the post-2025 market design. They suggest the current energy retail market, in expecting consumers to engage to make complicated decisions based on different financial outcomes for a largely homogenous service, largely fails to reflect consumer interest and preferences. In this respect, the energy retail market has failed to deliver the benefits people want or expect from their interaction with the energy system.

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2 Energy Consumers Australia, 2020. A Future Energy Vision, Consumer Expectations Research. https://energyconsumersaustralia.com.au/wp-content/uploads/1D-ECA-Future-Energy-Vision-Research-Forethought-Household-Presentation.pdf.

3 Nicholls, L. et al. (2019). Engaging households towards the future grid: experiences, expectations and emerging trends. https://aus01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fcur.org.au%2Fcms%2Fwp-content%2Fuploads%2F2019%2F03%2Ffuture-grid-homes-household-report-final-1-1.pdf, 4.

4 Ibid. P5.

5 Ibid. P4.

The benefits of a two-sided market do not require a large portion of the demand side to be made flexible, and any amount of DER can be valuable if consumers choose to deploy it for the benefit of the market. The success of a two-sided market and DER integration is contingent on those consumers that are interested in engaging with new products and services in the future energy market being able to do so with products, services and providers of their choosing.

Accordingly, new markets should be designed around how and what people want to engage in rather than a market that forces certain behavior from consumers.

### 4.4 Engaging with consumers

Effective and thorough consumer (and consumer advocate) engagement and consultation is crucial to the success of any future market design. Engaging consumers early to understand their preferences and behaviour will mitigate the risk the market is designed with unrealistic expectations of the level and type of engagement consumers wish to have with it.

As well as engaging consumers early and involving them in every stage of the market design process, PIAC considers the ESB's engagement should support three key objectives:

- Consumers should be confident decisions which will impact them - including decisions to make no change - are in their long-term interest and have been made with their views understood and accounted for.
- Where trade-offs are made by consumers, for example between price and reliability, they should be informed by consumer preferences.
- Where cross-subsidies occur between groups of consumers, or where services are above a minimum acceptable level, they should be well supported across the consumer base.

We consider the ESB's engagement should broadly meet the principles set out by the Australian Energy Regulator (AER) in its Consumer Engagement Guideline for Network Service Providers[6]. These are that engagement be:

- Clear, accurate and timely;
- Accessible and inclusive;
- Transparent; and
- Measurable.

## 5. Consumer protections

The consumer-facing elements of market design and consumer protections are interdependent and must be considered concurrently. The ESB does not specify any particular approach or options for consumer protections in the future market design, however, it does acknowledge their importance in delivering the post-2025 market and note existing consumer protections may need to evolve to be fit-for-purpose in the future. Fit-for-purpose consumer protections will be crucial to the success of the two-sided market and DER integration in particular.

[6] AER, Consumer Engagement Guideline for Network Service Providers, November 2013.

A consideration of the two-sided market and DER integration program on the basis of the nature of potential harm to consumers, rather than how they will benefit the market or the energy system, is necessary in developing fit for purpose consumer protections.

## 5.1 Existing protections arrangements

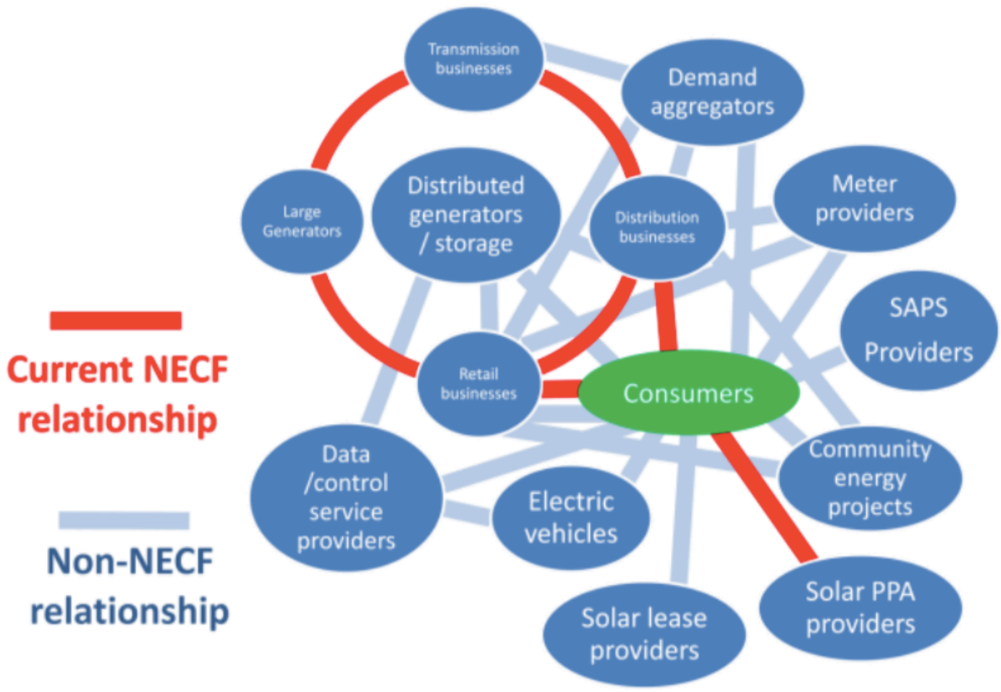
Energy specific consumer protections are currently provided through the National Energy Consumer Framework (NECF) and broader, non-energy specific protections are provided through the Australian Consumer Law (ACL). Until recently the combination of the NECF and ACL has provided adequate protections for the consumption of essential energy. As new energy technologies and services have proliferated, however, gaps in protections have emerged.

The NECF itself only provides for energy-specific regulation where there is a sale of electricity or gas. The requirements in the National Energy Rules (NER) for retail authorisation and exempt selling arrangements apply only where there is a financial transaction relating to the volume of energy and has generally revolved around the existence of a metered connection.

This means providers of many energy related services, with similar or worse degrees of potential consumer harms to those where energy is transacted, currently do not have to comply with any energy-specific regulation under the NECF. Instead, they are bound to the more general consumer protections under the ACL.

With emerging technologies and business models that do not involve metered transactions, this approach provides insufficient protections for some consumers (see Figure 2).

***Figure 2: Existing consumer protections framework***



Limiting protections only to where energy is metered and traded can create loopholes. For example, the provider of a product or service can avoid complying with consumer protections that apply under NECF's retail exemption arrangements by not selling energy on a per kWh basis and so avoiding the need for an exemption.

The transformation of the energy system demands reforms in the energy consumer protections framework so protections are not only accessed through meters and instead can accommodate the range of services and technologies that constitute a person's essential energy supply.

## 5.2 Harm-based consumer protections and types of energy usage

PIAC advocates for a system where the protections, including Explicit Informed Consent obligations and dispute resolution procedures, are commensurate to the potential harm the consumer may face should something go wrong: the higher the potential harm, the stronger the protections provided to the customer. Risks of lower harm require proportionately lower protections, that should be less burdensome on providers.

In considering harm-based consumer protections, not all customer loads have the potential for the same level of harm. Household energy usage sits on a spectrum from flexible or discretionary loads, which have no impact to the household's health and wellbeing, to inflexible or essential loads, which have the potential to impact the household's health and wellbeing (see Table 1).

***Table 1: Types of loads and harms***

| | **Flexible loads** | | **Inflexible loads** |
|---|---|---|---|
| | Increasing degree of potential harm to household | | |
| | Increasing need for consumer protections | | |
| Examples | • Home battery<br>• Pool pump | • Electric hot water systems<br>• Smart appliances<br>• AC on day 1 of a heatwave for typical household<br>• EVs – from, say, 100% to 50% of state of charge | • AC on day 4 of a heatwave for typical household<br>• AC for temperature-sensitive consumers<br>• EVs – last 10% of charge<br>• Lights and refrigeration |
| Potential harms | • No impact on health or wellbeing from deferring this energy use<br>• Potential for financial harm | • Inconvenience to household from deferring this energy use but little or no potential impact to their health and wellbeing<br>• Potential for financial harm | • Potential material impact to health and wellbeing from deferring this energy use<br>• Potential for financial harm |

As Table 1 shows, air-conditioning (AC) can sit at various points on the spectrum from flexible to inflexible loads. This depends on a range of factors governing the context of its use including the type of household that is potentially offering it and the time at which it is offered.

For instance, the impact to a household's health and wellbeing from reducing their AC load for an hour may be negligible on the first day of a heatwave, especially if the house has good thermal insulation and is well sealed, meaning there is only a small and potentially unnoticeable change in indoor temperature during the demand response (DR) event. However, this may not be the case if it is the fourth day of a heatwave or the house has poor thermal insulation. The potential impact on the health and wellbeing can be high at any time if anyone in the household is particularly temperature sensitive, such as those suffering from thermoregulatory illness, the elderly or young children.

One potential way to address this is to establish temperature ranges outside of which the indoor temperature is not allowed to deviate for households during a DR event through their AC. In this case, a typical household without thermal sensitivity may have a relatively wide temperature range (for example 15-28 degrees) within which the impact to their health and wellbeing is minimal. The automated AC can cycle down during a DR event while the indoor temperature remains within this range. During this cycling, if the temperature deviates from this range, the AC will cycle on again to maintain the household's wellbeing. By contrast, the temperature range for households that are temperature sensitive would be much narrower, for example, to a range of just 3-5 degrees. In both cases, the automatic maintenance of temperature within appropriate ranges can be supplemented with an override option for the household to opt-out in the lead-up to or during a planned DR event, for whatever reason.

Consumer frameworks, particularly protections, should be developed with these different loads and harms in mind, as described below.

## 5.3 Proposed approach to consumer protections

PIAC proposes a tiered approach to consumer protections commensurate to the potential harm from category of load being offered.

**Category 1 – flexible loads with negligible potential harm**

These correspond to the flexible loads described in Table 1, such as pool pumps and household batteries. For these loads there is no material risk to people's health and wellbeing – in fact most households will not even notice the loss of these loads for a short period of time.

The potential harm, if any, from the loss of these types of loads is limited to relatively minor financial impacts. As such, these types of loads can generally be adequately covered by existing, non-energy specific protections such as the ACL along with voluntary codes.

**Category 2 – potential inconvenience**

These correspond to loads in the middle of the spectrum described in Table 1 such as hot water systems and smart appliances such as washing machines and clothes dryers.

The loss of these loads for short periods may cause inconvenience to households but will not cause material risk of harm to health or wellbeing. These require basic protections beyond those

offered in the ACL, such as requirement for explicit informed consent but not as prescriptive or strong as those required for existing energy-specific regulations, such as hardship arrangements. Products and services with the potential to cause inconvenience may receive adequate protections through voluntary codes such as the New Energy Tech Consumer Code (NETCC), but only where these codes are adopted.

**Category 3 – higher potential harm**

Inflexible loads such as heating or cooling by air-conditioning, and EV charging, have a higher risk of causing harm to a household's health and wellbeing if lost. These loads should be subject to energy-specific consumer protections above and beyond the ACL and voluntary codes.

A harm-based protections framework that considers flexible and inflexible loads ensures consumers are protected for essential energy use, while at the same time encouraging new business models to enter the market to the benefit of consumers.

# 6. Market design initiative - Two-Sided Market

The move to a two-sided market offers a range of opportunities and risks for energy consumers. The benefits of more flexible demand and supply to the system can reduce network and wholesale costs for consumers, improve reliability and lower emissions. It can give some consumers more control of their energy bills and usage.

Increased participation of demand in the wholesale market also introduces new risks and costs both at a system and individual level, including from new communications and telemetry requirements and obligations associated with dispatch and scheduling. The increased control some consumers have will come with new obligations and complexity.

PIAC considers the key problems a two-sided market should address are:

- Consumers want access to products and services that allow them more flexible demand, but have very limited opportunity due to a lack of offerings.
- Third parties are unable to access the wholesale market to offer products and services to consumers that want them.
- The wholesale energy market lacks efficient levels of demand flexibility.
- The market operator cannot transparently deploy the demand-side in the same way as generation.

Any reforms to introduce a two-sided market design should solve these problems at least-cost and most benefit to consumers and in a way that promotes the timely transition to a zero-emissions energy system.

We respond to specific consultation questions on the two-sided market below.

### 6.1 What do you consider are the risks and opportunities of moving to a market with a significantly more active demand side over time? How can these risks be best managed?

The move to a two-sided market has a range of risks and opportunities for consumers, which can be managed in a number of different ways. They are discussed below.

#### Increased complexity of market

As more services and technologies become available, there is a risk the market may become more complex for consumers. While some consumers may accept, or even welcome, this complexity as it reflects an increase in choice, others may prefer more simplicity. The two-sided market should be designed on an opt-in basis to mitigate the risk this complexity will demand more engagement from consumers than they would prefer, while still allowing access to new products and services for those who want them. An opt-in two-sided market should focus on unlocking only flexible demand and flexible loads and leaving essential energy supplies untouched.

Under this model, consumers would likely continue to contract with retailers for their essential energy supply while aggregators would offer services to help them manage and create value from their flexible loads. Retailers would not be prevented from offering new products and services, however, retailers should not be the only energy service provider with access to consumers.

To ensure this model can function, the two-sided market reforms must ensure aggregators can compete on an even playing field with retailers to provide new energy products and services and offer services into the wholesale or other markets, and are not forced to partner with retailers to access consumers.

#### Increased overall cost of market

Increasing demand-side activity has the potential to increase the overall cost of the market as new technologies and capabilities are needed and new liabilities emerge. The potential costs can be limited in a number of ways.

The ESB should prioritise competitive outcomes in the provision of new technologies and services by allowing consumers to access demand response and other services from third-party aggregators, rather than just through a retailer. Allowing third parties effective opportunities to offer services in the wholesale market can drive competition between aggregators to provide these services and, potentially, spur retailers to offer new products to their customers. We further discuss the role of competition in increasing the benefits and lowering the costs of demand flexibility in the question below.

Ensuring requirements around scheduling, dispatch and forecasting are fit-for-purpose can also lower costs and maximise benefits of a two-sided market. We discuss how requirements for participation in the wholesale market can achieve better outcomes for consumers below.

#### Need to optimise across system

The two-sided market seeks to include demand-side activity in the energy wholesale market through AEMO's central dispatch. While PIAC appreciates this can provide considerable benefits,

such as introducing competition to the supply-side and allowing visibility and control of demand, it can also limit these services being provided in other, less complex and costly ways.

As a means to ensure consumers can access the services they want, from the provider of their choosing and at least cost, we recommend the ESB strongly consider what methods of rewarding and valuing demand flexibility best serves consumer interests. In PIAC's view, requiring the entire demand side to bid in to the market is unlikely to achieve this; extending the WDR arrangements to households, with third party aggregators that can bid into the wholesale market on households' behalf and on a voluntary basis, is preferable.

Also, the ESB should seek for demand response to be co-optimised throughout the supply chain, including ancillary services and network benefits, and not limited to energy wholesale.

## 6.2 What are the barriers preventing more active demand response and participation in a two-sided market? What are the barriers to participating in the wholesale central dispatch processes?

A number of barriers exist to more active demand response and participation in a two-sided market. We discuss three of the most significant – lack of third-party aggregators, scheduling and dispatch requirements, and inadequate consumer protections - below.

### Lack of third-party aggregators

Research by Energy Consumers Australia found more than half of household consumers were willing to voluntarily lower their energy use at peak times and even more were prepared to act with a financial incentive.[7]

A number of barriers exist to realising the potential benefits of more active demand response and participation in a two-sided market. One of the key limitations is the inability for consumers to access demand response and other behind the meter services from the providers of their choosing.

Under the current regulatory framework, third parties are unable to make wholesale demand response offers directly to consumers. The AEMC acknowledged this problem in its Reliability Frameworks Review, stating that:

> '...there are challenges for third parties looking to provide wholesale demand response. Third parties can only do so currently by either being a retailer themselves, or having a commercial relationship with a retailer.'[8]

These requirements have prevented third parties from approaching consumers and mean consumers are unable to access competitive offers for demand response and other services from third parties.

7 Energy Consumers Australia, 2019. Energy reform to put consumers in driver's seat, but must be extended to households. https://energyconsumersaustralia.com.au/news/energy-reform-to-put- consumers-in-drivers-seat-but-must-be-extended-to-households

8 AEMC, 2018. Reliability Frameworks Report. https://www.aemc.gov.au/sites/default/files/2018-07/Final%20report_0.pdf. P53

This forces consumers to access these services through their retailer, who, as is the case with demand response, may have no incentive to and little interest in providing it. This has led to an under-provision of services to increase demand participation and a less than efficient level of demand flexibility.

In early 2018, PIAC conducted a research project that involved 'mystery shopper' calls to retailers active in NSW, asking whether they offered demand response programs for residential consumers. Of the 23 retailers contacted, only one niche retailer, serving less than 0.01% of the NSW household electricity customer base, offered demand response. PIAC repeated the study in 2019, with the same result.

The absence of third-party demand response providers may also be discouraging policies that would increase overall demand-side participation. The most significant demand response trial to date, the Australian Renewable Energy Agency Demand Response RERT Trial, has not tested third-party aggregators providing residential DR. The results from this trial, which suggest lower household than commercial and industrial take up of demand response, are being used to inform the AEMC and other bodies' market design initiatives including demand response policies.[9] We note these results are not a reliable reflection of how an optimal demand response mechanism would work as consumers must participate through a retailer, and are not an appropriate guide for the design and development of the two-sided market.

Wholesale demand response, and any service that competes with generation in the wholesale market, challenges the interests of gentailers, such as AGL, which was the only participant in the ARENA household demand response trial in NSW.

The AEMC states in its final determination on the wholesale demand response mechanism that 'small customers would be unlikely to capture any value from being able to participate in the mechanism'.[10] It is unclear what the AEMC has based this assessment on. To PIAC's knowledge, the AEMC has not undertaken any research to understand consumer preferences towards wholesale demand response and no trial of it has been conducted using third-party aggregators.

The AEMC also notes in its final determination:

> [t]he value to individual consumers and to consumers collectively of more small customer demand response will grow as digitalisation becomes more prominent. A two-sided market would result in consumers benefiting from increasing opportunities to provide demand response services.

PIAC agrees increased digitalisation will enhance the value of demand response to both consumers, aggregators and the energy system. PIAC also considers the value to consumers and the market of demand response will grow as a mechanism for it is established and matures. In order to fully capture these benefits, the ESB should ensure the two-sided market gives consumers the opportunity to participate most efficiently and effectively by allowing third-party aggregators access to the demand response market.

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9 AEMO. AEMO/ARENA Demand response trials. https://aemo.com.au/en/initiatives/major-programs/nem-distributed-energy-resources-der-program/pilots-and-trials/demand-response-trials

10 AEMC, June 2020. Wholesale Demand Response Mechanism Final Determination. https://www.aemc.gov.au/sites/default/files/documents/final_determination_-_for_publication.pdf. P9.

Further, allowing third parties effective opportunities to offer demand response for participation in the wholesale market is expected to drive competition between third-parties to provide this service and, potentially, spur retailers to offer wholesale demand response products to their customers.

### Scheduling and dispatch requirements

Another barrier preventing more active demand response and participation in a two-sided market is the requirement for loads to be scheduled and dispatchable by AEMO. While PIAC appreciates AEMO's desire for visibility over demand and the increased value visibility can provide, the requirements to participate in dispatch and scheduling can be onerous, reducing the value of participating for aggregators and their customers. Concern over the burden of requirements to participate in central dispatch has been raised in the current AEMO process to design and implement the wholesale demand response mechanism. Large users have consistently highlighted in the technical working group that if AEMO sets their requirements as rigorously for wholesale demand response as for large-scale generation this will add unnecessary cost and onerous obligations for users wanting to participate. They have also highlighted that if full SCADA is required this will make involvement too costly for large users and aggregators of smaller loads.

We also note any arrangements for including flexible demand in the wholesale market should be suitable for flexible demand units rather than replicate what has been designed for large generators. As Enel X notes in its submission to the wholesale demand response rule change consultation paper:

> [D]emand response is an inherently different service to that provided by scheduled generators, whose business model reflects the primary purpose of generating electricity to sell into the NEM. A load does not exist for the primary purpose of buying electricity or offering demand response. Rather, its purpose is to carry out whatever business functions or personal uses that are of value to the user.
>
> Demand response is a recognition by an energy user that it can create additional value by being more flexible with when and how much it consumes. Subjecting parties who wish to offer wholesale demand response to the same obligations as scheduled generators fundamentally misunderstands the nature of demand response. It may also explain why so few NEM participants have volunteered to be classified as scheduled loads.[11]

The ESB's arrangements for two-sided markets must balance the value of having control and visibility over loads with the need to offer value to participants.

### Inadequate consumer protections

The matter of developing fit-for-purpose consumer protections for an evolving energy market has been on the agenda for years. Frustratingly, it remains unresolved, impacting the uptake of new technologies and hindering competition where it is needed. In 2016, COAG Energy Council began consultation on consumer protections for behind the meter electricity supply. The resulting New Energy Technology Consumer Code is yet to be implemented. Research from the Australian

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11 Enel X, 2018. Submission to wholesale demand response mechanism consultation paper. https://www.aemc.gov.au/sites/default/files/2019-01/Enel%20X.pdf. P13.

and New Zealand Energy and Water Ombudsman Network into how to ensure ombudsmen schemes remained fit-for-purpose found there were large gaps in coverage for new energy technologies and they were often unable to help consumers seeking their services.[12] A lack of appropriate consumer protections was cited as one of the key concerns driving the AEMC's decision in 2020 to limit households from participating in the new wholesale demand response mechanism.[13]

It states in its final determination:

> [T]he Commission was not able to satisfy itself that a rule including small customers would be likely to contribute to the achievement of the national energy retail objective (NERO), due to the difficulty in adequately addressing the application of energy-specific consumer protections to arrangements between small customers and Demand Response Service Providers (DRSP) under these rule change requests, given that a holistic review is required which may conclude that changes to the NERL are necessary.
>
> [T]he Commission considers that progressing regulatory reforms that facilitate the transition towards a two-sided market is the best approach to allow small customers to more actively participate in the market.

The AEMC highlighted the issue of consumer protections in its 2020 Retail Energy Competition Review, indicating consumer protections for new energy services such as wholesale demand response would be considered in the ESB's two-sided market workstream.[14]

Despite the clear need for updated consumer protections and the promise of them being considered in the two-sided market workstream, they are given little consideration in the Post-2025 consultation paper.

The two-sided market workstream does not present any models for how consumer protections would be provided in the two-sided market, how they might contribute to or inhibit the functioning of the market, nor does it make any recommendations on what changes might need to be made to ensure consumer protections are adequate for any future market design.

We consider this a considerable gap in consultation and one that will have negative consequences for the ESB's work in developing and implementing two-sided market reforms if it is not prioritised and addressed promptly.

The impact a lack of fit-for-purpose protections can have on the development of a market can be seen in the case of wholesale demand response, where a large portion of potential participants have been excluded from the market due in part by a lack of appropriate consumer protections.

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12 Australian and New Zealand Energy and Water Ombudsman Network, 15 October 2019. What will energy consumers expect of an energy and water ombudsman scheme in 2020, 2025, and 2030? https://www.ewon.com.au/content/Document/Publications%20and%20submissions/EWON%20reports/ANZEWON-report-Dec-2019.pdf

13 AEMC, June 2020. Wholesale Demand Response Mechanism Final Determination. https://www.aemc.gov.au/sites/default/files/documents/final_determination_-_for_publication.pdf. P 8,9.

14 AEMC, 30 June 2020. Retail Energy Competition Review. https://www.aemc.gov.au/sites/default/files/documents/2020_retail_energy_competition_review_-_final_report.pdf. P ix.

The ESB should consider consumer protections as essential components of a functioning market and focus on developing them at the earliest possible stage of design.

## 6.3 Do you think any other near term arrangements or changes to the market design can be explored in this workstream?

Expanding the Wholesale Demand Response Mechanism to small consumers as soon as possible.

## 6.4 What measures should be deployed to drive consumer participation and engagement in two-sided market offerings, and what consumer protection frameworks should complement the design?

As noted earlier, fit-for-purpose consumer protections are critical for the success of a two-sided market and should be considered in its design at the earliest possible stage. The ESB states it will make 'recommendations on an approach to energy-specific consumer protections that would apply under a two-sided market' as part of the post-2025 market design work. We strongly recommend the ESB take the harm-based approach to consumer protections outlined earlier in this submission. Household demand response can be used to demonstrate how harm-based protections could be applied in a two-sided market.

### Demand response and harm-based protections

The potential harm to households from any particular DR event depends on a number of factors including:

- The type of energy use being affected by the DR event (e.g. whether it is heating/cooling load or battery storage) and its duration;
- Characteristics of the household itself, such as whether there are medical conditions that impact its energy usage; and
- The context of when and where the DR event occurs, such as whether it is on an extreme weather day.

Very broadly, these could be categorised as either:

- Financial harms; in terms of choosing an appropriate offer, payment conditions or warranty terms. For instance, if there is information asymmetry between potential DR providers and households regarding the value of the DR load, households may not be well-placed to properly compare competing offers and judge which is most suitable for them.
- Inconvenience; from the unavailability of some appliances during a DR event. For instance, there may be potential impacts to the household's amenity from temporary loss of controlled load hot water.
- Harms to health and wellbeing; from the unavailability of some appliances during a DR event. For instance, there may be potential impacts to an individual's health from losing full access to heating or cooling devices during extreme weather events.

The potential financial harms from DR may be comparable to the potential harms that currently exist for households through their own investment in behind the meter technologies such as

rooftop PV. In this regard, the existing customer protection frameworks provide ample protections for some DR.

By contrast the potential harms to health and wellbeing from DR are fundamentally different to those that currently exist, including for traditional grid supply of energy. In the case of an unplanned outage of the traditional grid supply, the harm is from the loss of all (or at least a significant portion) of the energy supply to the home for an indefinite time until the outage is resolved. In the case of DR for households, the harm is from the loss of full usage of one or several specific appliances within a home for a relatively well-defined period until the DR event ends, typically with the option to opt in and/or out of a DR event.

There are several important differences to highlight in the case of DR: it is inherently controllable; it is only for specific loads not the entire home's supply; it is not necessarily the full loss of supply of those loads; it is for a finite time; it can have an optional override function; it may avoid wider load shedding which has a higher impact and, being voluntary, it allows households to nominate their own flexible loads.

There are household demand response options which have no material risk of affecting people's health and wellbeing, such as pool pumps and household batteries. Australian Consumer Law already provides the key consumer protections people need for demand response with these loads.

Some demand response options - such as hot water systems and smart appliances - may cause inconvenience, but have no material risk of harm to health or wellbeing. These could be part of the demand response market subject to DRSPs being signatories to the New Energy Tech Consumer Code (NETCC).

Some loads with the potential to cause harm to people's health or wellbeing - such as air conditioners and electric vehicles - are currently not covered by energy specific protections, and require higher levels of protection than what is afforded under Australian Consumer Law. These should not be part of the demand response market before appropriate consumer protections have been extended to them, and the work to develop these protections should commence at the earliest opportunity.

## 6.5 What might principles or assessment criteria contain to help assess whether it is timely and appropriate to progress through to more sophisticated levels of the arrangements?

We recommend the ESB assess the need to progress reforms based on whether current arrangements are delivering the most efficient, affordable, sustainable balance of supply and demand resources for consumers. It should consider the priorities and principles of consumers, such as PIAC's outlined in Section 3 to assess whether the market design is achieving this objective.

### 6.6 The ESB is considering combining the DER integration (below) and two-sided markets workstreams, or elements thereof. Do stakeholders have suggestions on how this should be done?

PIAC considers there is considerable overlap and interdependency between the Two-Sided Market and Integrating DER workstreams and the two may benefit from being combined. If the two workstreams are combined, the ESB should conduct information sessions for stakeholders explaining for instance where the two programs overlap, how their amalgamation will impact each workstream, and the stage each is at.

## 7. Market design initiative - Valuing demand flexibility and Integrating Distributed Energy Resources

There are considerable crossovers between the Two-Sided Market and DER Integration workstreams. Both are concerned primarily with accessing flexibility in energy use to bring about wider consumer benefits. As such, many of the opportunities and risks of a two-sided market are also seen in integrating DER and similar solutions can be deployed across both.

We highlight in particular:

- DER integration should prioritise allowing third-parties other than retailers to provide services directly to consumers.
- The infrastructure required for DER participation, such as telemetry and communication technologies, should not be unduly costly or burdensome.
- Market integration should focus on unlocking flexible, not essential, energy loads.
- Models for integrating DER should be designed based on consumer preference and behaviour.
- Non-wholesale market level options, such as distribution-level markets, should be considered amongst potential solutions.

We respond to specific consultation questions below.

### 7.1 Have any key considerations for the incorporation of DER into the market design not been covered here? For DER to participate in markets, it needs to be responsive. How should the Post-2025 project be thinking about enabling responsive DER?

Please see our answer to Question 2 in the Two-Sided Market section for how PIAC recommends the ESB consider enabling responsive DER.

As well our response to Question 2, we recommend the ESB centre consumer preferences and behaviour in any reforms or designs to enable responsive DER. PIAC and a number of other consumer representatives wrote to members of the ESB in September requesting more consumer input in the design work around integrating DER.

In its communication with ESB members, the consumer groups highlighted the DER integration work would benefit further from greater consideration of consumer design - developing systems, products, services and value propositions from an end user perspective (including those without

access to DER and considering present and latent needs). This goes one step further than looking at the technology/appliance a consumer interacts with, and considers consumer agency and preferences. We suggest a session that includes consumer design specialists, consumer representatives and possibly consumers.

The group recommended the two-sided market and DER integration work should include a number of system architecture models, including a decentralised or bottom up model, for consideration and analysis. The development of the models should be informed by a vision of the future energy system from a consumer perspective and guided by clear objectives and requirements/characteristics.  For example, objectives/requirements should include:

- Small consumers should not be required to directly interact with the wholesale market to trade their DER (i.e., they will do so mainly via aggregators, so that individual consumers do not need to be scheduled).
- Where it is cost effective to do so, or at least the costs can be recovered from the beneficiaries, small consumers should be able to trade energy with each other via distribution level trading platforms (like deX, Reposit and PowerLedger).

Each system architecture model should include a consumer impact assessment (not just total consumer impact but also distributional outcomes). This could be considered across time or be a dynamic model, for example, reflecting both transition and future end states.

The group noted while it may not be cost effective to shift to a particular system design now, envisaging end states can stimulate innovation, inform investment decisions, and ensure rule and regulatory changes are consistent with a future state.

The group also suggested, given the breadth and complexity of the post 2025 reform work, including a number of reflection and review points to ensure reforms are in the best interest of consumers.

### 7.2 In the next phase of the project, the ESB proposes focusing on development of a detailed DER market integration proposal. What are the most important priorities for DER market integration? We are considering combining the DER integration and two-sided markets workstreams, or elements thereof. Do stakeholders have suggestions on how this should be done?

PIAC considers there is considerable overlap and interdependency between the Two-Sided Market and Integrating DER workstreams and the two may benefit from being combined. If the two workstreams are combined, the ESB should conduct consultation with stakeholders to seek input and explain how their amalgamation will impact each workstream, and the stage each is at.

### 7.3 How can we ensure owners of DER can optimise the benefits of their DER assets over time as technology and markets evolve? How do we time reforms to manage the costs and benefits for DER owners?

The ESB should avoid the minor incremental short- to medium-term reforms that often prove to be 'band-aid solutions' and instead seek fundamental reforms that realise more benefits and efficiency in the longer term.

## 8. Market design initiative - Transmission Access and Coordination of Generation and Transmission

The ESB highlights a range of problems associated with the current arrangements for transmission access and coordination of generation and transmission. PIAC considers these problems can only be fully addressed through a planning and investment framework which delivers efficiency for strategic, whole-of-system investments.

The current regulatory framework is designed to deliver efficiency of incremental investment to a centralised generation and transmission system that has already been 'built out'. However, the transformation the NEM is experiencing is not incremental – it is a step change.

Without a planning and investment framework which delivers efficiency for strategic, whole-of-system investments, we expect to see the cumulative impacts of individual generation and transmission investments diverging from the optimal system-wide outcome with:

- Inefficient generation investment – in terms of the sizing of new generators; their location and impact on the network; the cost to connect each individual generator including those otherwise efficient investments which do not occur; and the geographic and fuel source diversity of the generation fleet as a whole.
- Inefficient network investment – in terms of the shallow connection assets to connect new generation; the deeper assets required to connect the new generation to major load centres; the interconnection of major load and generation regions to make the most of fuel diversity and maintain reliability of supply; and the ability to maintain system security and stability.
- A lack of coordination between generation and network meaning consumers may have to pay twice for the same problem to be attempted to be solved by both a generation and network investment.
- Missed opportunities to exploit economies and scale and scope.
- A longer and more expensive transition to a low- or zero-emissions energy sector.

All of these ultimately lead to increasing pressures on consumers through the wholesale and network components of their electricity bills as well the impacts of climate change.

In other jurisdictions, most notably the US, this is done using an Integrated Resource Plan (IRP) by a central planning authority. An IRP will typically specify the optimal technical characteristics, timing and location of centralised generation, network and demand-side investments as well as the optimal retirement of existing assets. Importantly, the centralised planning authority will usually have the power to implement all the necessary investment decisions in its IRP.

In the NEM, there is no such centralised authority and this role is instead delegated to market forces through a combination of price signals and regulatory oversight. In response to the need for strategic vision in developing the NEM for the future, the Australian Energy Market Operator (AEMO) created the Integrated System Plan (ISP).

The ISP is different from an IRP in a number of important ways. Most notably, the ISP only specifies the transmission investment required. Under the current regulatory framework, it does not and cannot direct investment decisions in other stages of the supply chain such as generation. Instead, it requires industry to respond to signals set out in the ISP and other signals already part of the NEM to achieve the optimal whole-of-system outcome. If this does not happen, the expected benefits enabled by the transmission investment may not eventuate, such as the entry of low-cost, renewable generation and/or storage in a particular region.

PIAC has identified three objectives that the regulatory framework for delivering centralised generation and transmission must deliver, especially in the current context of the NEM's transformation and affordability challenge. We use this as a framework for assessing the need and priority of any reforms to the current framework and the merit of any solutions proposed. The framework must:

- Identify the most efficient system-wide solution;
- Deliver the solution in a timely and efficient way; and
- Recover costs for the delivered solution in the fairest and most equitable way.

A number of barriers prevent the existing planning and investment frameworks from achieving these objectives.

1. **Disaggregation of the supply chain means decentralised responsibility and hence misalignment of individual incentives and drivers from whole-of-system outcomes.**

   For efficient structural change to happen, in the absence of a whole-of-system plan, market signals must be sufficiently clear and the prospective investors must be sufficiently comfortable with them to make investments in line with the ISP modelling. Without this, the necessary merchant generator and storage investment may not eventuate in time or at all despite the transmission investment having been made.

2. **Narrow interpretation of planning and economic assessment functions limited to electricity sector or particular stage in the electricity supply chain.**

   To date, the high-level cost-benefit tests for planning have been based more around incremental investment efficiency rather than whole-of-system optimisation – meaning each investment is assessed in isolation and not necessarily as an interrelated suite of investments. Continuing to do so risks overlooking the benefits, costs and trade-offs which arise from the interrelation of multiple projects. This is especially true where the projects have substantial impacts across the NEM.

Under the current planning and regulatory frameworks, the use of demand-side options to address both supply and network issues has been limited. There has been considerable commentary and review into multiple potential causes of this including:

- biases created because expenditure on non-network options is treated differently in network regulation than expenditure on network options;
- biases created because the cost-benefit analysis tests only consider impacts (both costs and benefits) within the electricity supply chain; and
- cultural biases against non-network solutions by organisations and decision makers running the tests.

3. **Lack of access rights means connecting generators are unwilling to fund transmission investment.**

Under the current open access regime for generator connection to the transmission network, while they have a right to connect, no generator has any right to access the regional reference node (and hence earn the regional reference price for generation output). Instead, generators may not be dispatched (either only partially dispatched or not dispatched at all) by AEMO due to constraints in the network.

While provisions are in place for generation-funded augmentation to the network to remove these network constraints, the generator which funds them has no assurance they will benefit from their investment. Instead, the behaviour of existing generators or the entry of a new generator may cause network constraints.

4. **Barriers prevent exploiting economies of scale in connection assets for new generators**

The existing regulatory framework was developed when a mature generation fleet and transmission system was already in operation. As such, the regulatory framework is better suited to incremental investment in energy infrastructure rather than delivering more strategic investments such as the coordinated connection of multiple generators in Renewable Energy Zones (REZ).

Being able to exploit economies of scale in connection assets would mean lower connection costs overall (with cost reductions ultimately passed on to consumers through lower wholesale prices) and potentially more low-cost and low-emissions generators being able to connect (which also leads to lower wholesale prices and faster emissions reductions).

The regulatory framework typically requires new generation to lead network expansion, creating a ‘chicken and egg’ dilemma. New generation projects cannot be committed without transmission access, yet under the current framework it is difficult to justify the necessary transmission investment without committed generation at scale.

5. **Uncertainty of cost recovery means TNSPs are unwilling to make unregulated investment prior to generation commitment**

As noted above, there currently exists a 'chicken and egg' dilemma for transmission investments for multiple expected generator connections. Generation cannot commit without transmission access, yet under the current framework it is difficult to justify the necessary transmission investment without committed generation.

This is especially problematic where a number of new generators are expected to be connected in a single area and the most efficient solution to connect all of these would be to create new large transmission infrastructure to be shared between multiple generators.

It is unlikely these generators would all connect at the same time or in a coordinated fashion. Under the current framework, the TNSP would build several smaller connection assets for each generator as they connect, which leads to higher overall costs and (otherwise prudent) generators not connecting at all.

6. **Prospective connecting parties not exposed to full costs and benefits of their choice of connection**

The connection of a new generator to the transmission system, or the upgrade of an existing one, can impose a number of different costs and benefits on the system as a whole. Currently, generators are only explicitly exposed to some of these, namely: their shallow connection costs and the costs associated with providing any required system strength services as a result of the connection.[15] However, connecting parties are not exposed to other impacts they may have on the broader network such as any deeper network costs they impose on the TNSP.

PIAC and others have noted that the Marginal Loss Factors (MLF) that apply to individual generators have been changing at a faster rate and greater magnitude than anticipated by many generation investors. Because MLFs are allocated to each location in the transmission network, the impact on overall system losses and efficiency from a new connecting generator is shared across all nearby parties rather than by the new generator alone. This dampens the incentive for connecting generators to reduce their impact on overall system losses.

7. **Misalignment of benefit and cost recovery**

The current investment efficiency tests, such as the RIT-T, are designed as broad cost-benefit analyses that do not differentiate which NEM region these costs or benefits occur in – they only consider the total costs and total expected benefits across all consumers throughout the NEM. This is in contrast to the way costs are recovered through network prices, which are mostly charged in the region the expenditure occurs.[16]

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15 Exposing the connecting to their impact on local system strength is a new addition to the regulatory framework following the Managing Power System Fault Levels rule change concluded in 2017.

16 There are mechanisms in place to apply network costs across network jurisdictions. However, we consider the effectiveness of these in certain cases to be very limited. For instance, the inter-regional TUOS only applied to the locational component of transmission costs (currently 50%) and does not address the risk of asset underutilisation. This is discussed further in PIAC, *Submission to Coordination of Generation and Transmission Investment options paper*, October 2018, 6-8.

> For projects that are incremental expansions or reinforcements of the existing network, this misalignment does not pose a significant issue as the expected benefits from the investment accrue mainly to consumers within one region. However, this is not necessarily the case for more strategic or nationally significant investments where a significant proportion (even the majority) of benefits may accrue consumers in a different region.
>
> This means that one set of consumers may be paying for the benefits received by a different set of consumers, and runs counter to the principle of cost-reflectivity. Further, if the misalignment between costs and benefits is large, a particular project may actually have a negative net economic benefit (i.e. an overall detriment) for consumers in one network's jurisdiction.

PIAC has proposed a number of solutions and reforms to address these issues, including:

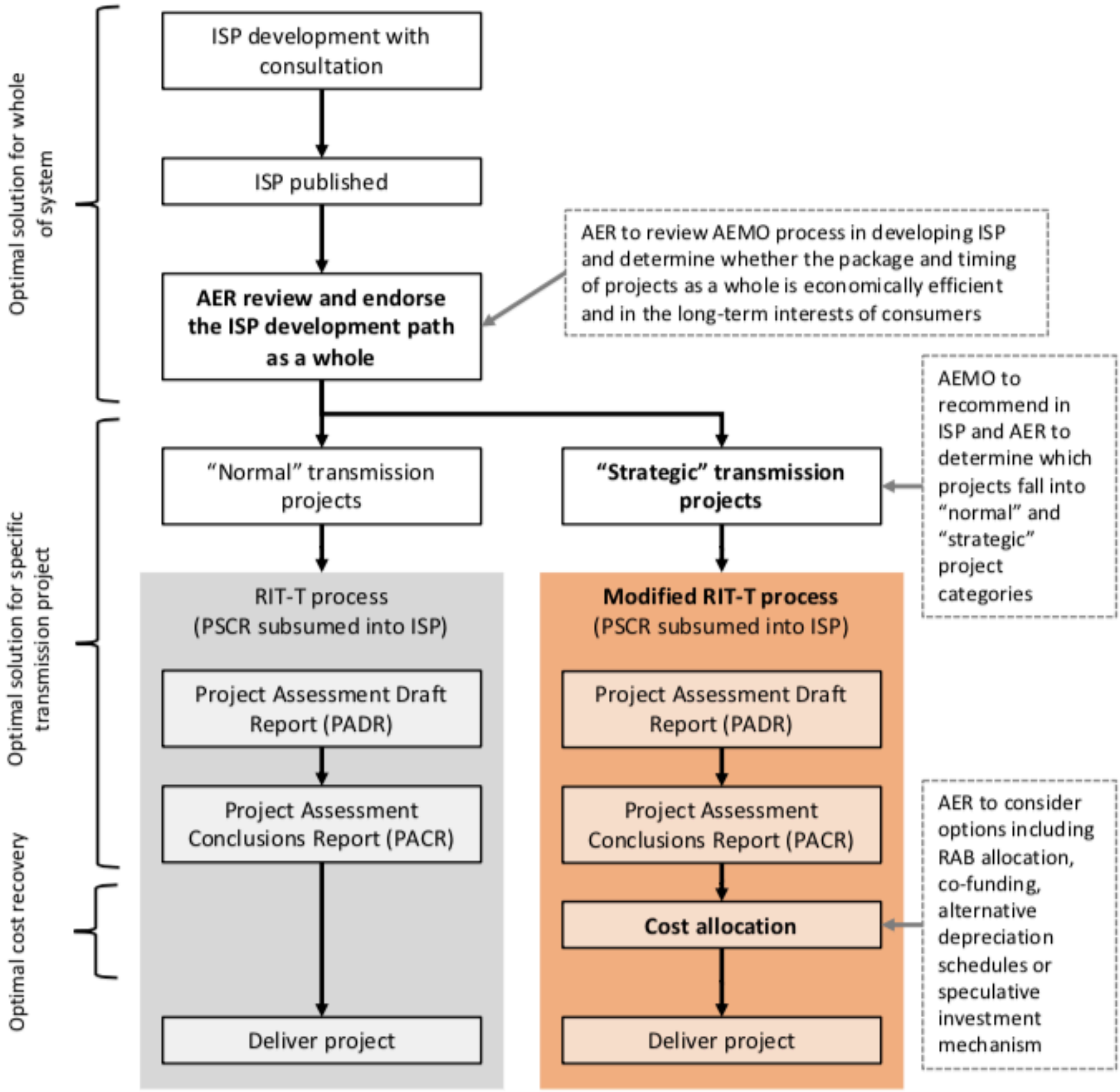
- Formalise the ISP within the Rules with thorough public consultation
- Equally consider both supply- and demand-side solutions
- Internalise impacts such as climate change in interpreting the NEO
- Review the access regime for generator connections
- Introduce greater locational signalling for connecting generators
- Share risk and cost recovery for generation-leading investment
- Recover strategic investment costs from NEM regions proportionate to the benefits accrued

We discuss them as they relate to specific consultation questions below.

### 8.1 The second ISP has now been released. Do you have any comments on how its implementation can be made more efficient and timely?

Formalising the ISP in the Rules more fundamentally integrates it into the existing planning and regulatory approval processes for networks such as the RIT-T. However, PIAC proposed a different approach to integrating the ISP into the existing transmission investment framework, using the model in Figure 3.

*Figure 3: Model for integrating ISP*




Like the model recommended by the ESB, PIAC's model makes use of the existing RIT-T process as a starting point but augments it to reflect the unique nature of strategic projects. Most notably it includes an assessment of the most appropriate cost allocation for ISP projects as part of the RIT-T process to account for the fact that benefits will likely accrue to multiple NEM regions and not just the one in which the assets are physically located.

PIAC's model will make the ISP more efficient by helping to ensure the optimal cost allocation in addition to the optimal solution. Further, by ensuring the ISP presents a robust and least-cost plan that is transparently developed, it will improve the timeliness of the its implementation.

**Optimal solution for whole of system**

In order to ensure transparency and wide support of the development path, AEMO should consult broadly with all stakeholders in developing the ISP. PIAC considers it essential that the AER has a formal role in reviewing the final ISP. The complementary roles and skillsets of AEMO as national transmission planner and the AER as the economic regulator and compliance enforcer will help to ensure the robustness of the modelling and help achieve widespread acceptance of the development path.

Specifically, PIAC considers that the AER should review:

- AEMO's process in consulting on and developing the ISP. This would include the appropriateness of the range of scenarios and investment options considered in modelling and how effectively AEMO had engaged with stakeholders and reflected their feedback in the ISP development process; and

- whether the package and timing of projects as a whole is economically efficient and in the long-term interests of consumers. It is important to note this assessment by the AER would look at the package of projects as a whole and not individually. Therefore, it would not seek to re-do the cost benefit analyses or other more detailed modelling AEMO has conducted in developing the ISP.

Further, in developing its portfolio of individual transmission projects, AEMO should recommend and the AER determine which of these projects should be considered to be "strategic" transmission projects. The market modelling conducted as part of the ISP development should be used as a starting point for the AER's determination.

**Optimal solution for specific transmission project**

Based on the AER's determination, the individual transmission projects would follow either the regular RIT-T process or a modified version which reflects the unique nature of strategic transmission projects including, but not limited to:

- The allocation of costs to multiple NEM regions, including the degree to which they are align with the accrual of benefits (including considering a range of appropriate sensitivities or alternative scenarios);
- A broader range of benefits and costs which could be considered either directly or qualitatively in the cost-benefit analysis; and
- Determining the need for, and potentially the structure of, alternative cost-recovery mechanisms if the current regulated cost-recovery methods are unsuitable.

As a result of this process, the TNSP should identify the optimal size, configuration, use of non-network options and timing of the project to meet the identified need (i.e. the preferred option). In addition, the TNSP may make a recommendation as to whether there is any need for an alternative cost recovery mechanism as described below.

**Optimal cost recovery**

PIAC considers the AER would be best-placed to make a formal determination as to whether an alternative cost-recovery mechanism is required and what form it should take. This would likely

need to be made on a project-by-project basis to allow the AER to appropriately balance the risks and return for businesses and ensure the project is in the long-term interests of consumers.

Those who benefit from a given investment should also pay for that investment. Where there are multiple beneficiaries, the costs should be recovered proportionally to their share of the benefits, and where it is not practical and transparent to identify the beneficiaries, a causer-pays principle should be used.

For the preferred option identified in the RIT-T process, the AER must determine whether the existing cost recovery mechanism for regulated transmission projects is sufficient or whether an alternative mechanism is required. This determination should use the distribution of expected benefits modelled as part of the RIT-T assessment as well as other sources deemed necessary.

The AER should consider a range of factors affecting the equity of risk allocation and cost recovery including but not limited to:

- The alignment of benefit accrual to cost allocation with respect to location – for instance if the majority of costs would accrue to one NEM region while the majority of expected benefits would accrue to another.
- The alignment of benefit accrual to cost allocation in terms of time – for instance if the expected benefits do not eventuate for many years after the investment must be made.
- The degree to which the benefit accrual is affected by a range of potential alternative scenarios.
- If the investment is deemed to be a Renewable Energy Zone, the AER should determine that consumers are not best placed to bear the utilisation risk or network cost; these should be borne by the TNSP as a speculative investment and/or generators as part of their connection charges.

If the AER determines that an alternative cost recovery mechanism is required, it should require appropriate measures to be applied, including:

- Revenue or RAB allocation to particular NEM regions according to where the benefits are expected to accrue rather than where the physical assets are located.
- Alternative depreciation schedules to help address any temporal misalignment of costs recovery and benefit accrual.
- Co-funding of network investment with other parties to recover costs from parties who are better placed to manage the risks or uncertainties.
- Underwriting of network investment to reduce the risks or uncertainties which may otherwise prevent investment proceeding.
- Speculative investment mechanisms such as for generation-leading transmission investment.

## 8.2 The cost of major transmission investment projects is of concern. Do you have any suggestions on how these projects can be built for less than currently expected? Why have costs increased so markedly? Given the rising costs, are there alternative approaches to transmission project development, design and implementation which could lower the cost?

To limit the costs of major transmission investments, the policy and regulatory framework must allocate responsibility and incentives to those parties that have the capacity to manage the various risks and deliver the entirety of the modelled benefits to consumers.

The risks and rewards these parties are exposed to must be symmetric with respect to the magnitude of costs and benefits. The financial incentives parties receive must be in relation to efficiently achieving the end result, not dependant on the technology or the solution used to achieve it.

PIAC is concerned by the potential for project cost increases claimed by TNSPs between the RIT-T and the Contingent Project Application, as recently seen in Project EnergyConnect. It is well within the TNSP's power, and indeed responsibility, to develop and use accurate capex forecasts in the RIT-T to fairly assess options to address the identified need. Allowing TNSPs to routinely underestimate capex forecasts to pass a RIT-T should only be allowed if they also bore the financial risk associated with the actual costs being higher. While the current framework allows such costs to be passed through to consumers, a cap should be implemented to limit its scale (for instance 20%, to allow for some degree of reasonable, unforeseen cost escalations).

Networks must not be able recover costs from consumers greater than the anticipated benefits of new investments.

In addition to keeping the cost of major transmission investments down, it is imperative they are also recovered from the most appropriate parties in a fair and equitable way. As noted in response to the previous question, costs should be recovered such that those who benefit from a given investment pay for that investment. Where there are multiple beneficiaries, the costs should be recovered proportionally to their share of the benefits, and where it is not practical and transparent to identify the beneficiaries, a causer-pays principle should be used.

Cross-subsidies should only be permitted where they are accepted by informed consumer feedback or are immaterially small.

### 8.3 The development of REZs is important for the transition underway in the NEM. Do you have any suggestions on how large-scale priority REZs can be more efficiently developed and connect into the network?

PIAC has developed a model for how the cost and risk of investment in new and existing transmission for Renewable Energy Zones (REZ) could be shared between consumers, generators, transmission network service providers, and other investors. It is summarised in Figure 4 and described in more detail below.

***Figure 4: Summary of the PIAC risk sharing model for Renewable Energy Zones***

| | |
|---|---|
| **Identify REZ** | • Initiated by AEMO, government or industry<br>• Indicative capacity and location/s determined<br>• Network options for design determined |
| **Design transmission** | • Market testing of prospective generators<br>• Planning and approval processes commence<br>• Specify prescribed capacity<br>• Apportion capex to generators and consumers |
| **Choose investor** | • Contestable tender or reverse auction process<br>• One or more transmission options<br>• Lowest bid rate of return selected<br>• Develop revenue and access proposal |
| **Determine revenues** | • Capex for TNSP and speculative investor<br>• Opex for TNSP<br>• Connection charge cap for generation |
| **Build and operate** | • TNSP builds and operates network<br>• Generators build and operate generation |
| **Connect generation** | • Generators pay connection charge<br>• Charge per MW paid to speculative investor<br>• Earlier payment reduces charge |

Core to the PIAC model is that the recovery of capex is split between generators and consumers, rather than just borne by consumers, with the amount apportioned to generators funded, contestably, by a speculative investor. This amount could be determined by the regulator or by government, and be based on a combination of:

- The value of access to the REZ for connecting generators, compared to the costs and risks incurred with the same investments being made under the current access arrangements at the time;
- The market benefits to consumers of the REZ being built, compared with the same investments being made under the current access arrangements at the time;
- Where the REZ is part of an interconnector or other transmission investment, the portion attributable to consumer or generator benefits; and
- Other policy objectives.

Under PIAC's model, feasible prospective REZs, including any necessary supporting network investments, are identified through the existing ISP process by AEMO, industry or government. A detailed design stage, incorporating a RIT-T or equivalent process, determines the optimal attributes for a given REZ, and selects one or more network design options that are best suited to support efficient investment and market outcomes. This stage includes market testing with prospective generators, investigation of planning approvals, and estimation of capex for different network options. A variety of sources of information should be considered to minimise the risk associated with speculative investment.

A key attribute determined in the detailed design stage is a prescribed 'efficient' capacity level, expressed as the firm/maximum physical capacity of new generation supported by the REZ. This attribute will reflect a number of factors, including:

- The level and certainty of current generation market interest in and near the proposed REZ, and the current state of the generation investment market more broadly.
- The potential future investor interest in and around the REZ, considering the nature of the energy resource, planning opportunities and constraints, government energy and planning policy, and anticipated energy market conditions.

The function of the efficient/nominal capacity level is described in the following section on risk and cost sharing.

During the design stage, direct recovery of capex up to the ‘efficient’ capacity is apportioned between generators and consumers.  The risk sharing basis for this apportioning is described in the following section on risk and cost sharing.

A contestable process, such as a tender or reverse auction, is conducted to choose an investor to fund the speculative portion of the capital spend associated with the REZ. The successful bidder is chosen on the basis of the lowest rate of return offered. This portion is ultimately recovered from connecting generators via connection charges. The remaining capex, and all opex, is rolled into the RAB of the incumbent TNSP and recovered from consumers via conventional TOUS charges.

The AER approves all revenue up to the 'efficient' capacity, including the cap on generator connection charges, before the REZ is built.

The TNSP builds and operate the new and augmented transmission network assets required for the REZ. Assets may be built in stages to manage costs and finance impacts.

New generators that connect to the REZ pay a connection charge to recover the costs of the speculative investor. This could be paid at any time between when the REZ revenue is determined and the generator is connected. By avoiding some of the speculative rate of return, earlier payment of connection charges could lower connection costs for the generator.

For ease and feasibility of implementation, the model should use elements of current arrangements as far as practicable. These include:

- the generator connection process and charge structure;
- mechanisms to allocate TUOS charges to consumers; and
- regulatory processes and governance measures.

**Cost and risk sharing**

Under PIAC's REZ model, risks and costs are shared between multiple parties based on the principles that beneficiaries should pay and risks should be allocated to those best placed to manage them.

The costs allowed to be recovered for investment up to the prescribed 'efficient' capacity would be regulated. Their recovery apportioned between:

- Generators. This portion is funded by a speculative investor and recovered directly from connecting generators via connection charges; and
- Consumers. This portion is rolled into the RAB of the incumbent TNSP and recovered directly from consumers via conventional TOUS charges.

If the generation and transmission investments enabled through the speculative investment prove to be efficient and prudent, these costs will ultimately be passed through to consumers as well.

The revenue from this investment up to the prescribed 'efficient' capacity would be shared between:

- The incumbent transmission network service provider. This portion of the cost of investment would be recovered from consumers in a manner similar to how transmission network service providers currently recover shared network costs.
- The speculative transmission investor. This portion would be recovered from generators who would pay a connection charge to connect to the renewable energy zone. The connection charge would be proportional to the generator's capacity and how early they connected. That is, at any given point in time, the cost for generators to access prescribed capacity would be a fixed rate in terms of $/MVA. The rate paid by generators would increase with time according to a speculative rate of return escalation factor.

If a speculative transmission investor considers that interest in a REZ may be more than the prescribed 'efficient' capacity level determined, then the transmission investor may fund this additional capacity and negotiate with generators as unregulated revenue. They could seek higher returns for this portion to compensate for the additional risk of investing in capacity without guaranteed cost-recovery.

**Value proposition**

Under the PIAC model, generators are protected from the risk of REZ underutilisation and timing misalignment between different generation projects. In lieu of bearing these risks, generators effectively pay a rate of return premium to TNSPs, who bear some of the timing risk. Generators are incentivised to reduce this risk by connecting, or at least paying to connect, earlier.

Speculative transmission investors thereby voluntarily take on underutilisation risk for their portion of investment costs, and receive an uplift in their rate of return for doing so.

The incumbent TNSP is protected from the risk of asset stranding as their costs are recovered from consumers under normal arrangements, but they are free to bid for the contestable speculative investment.

At the same time, the PIAC model reflects consumers have little or no ability to manage the risk of underutilisation or asset stranding in REZs and are not direct beneficiaries of generator connection assets. The speculative investment represents value for consumers because it prevents inefficient transmission investment and a less competitive wholesale market from being fully socialised to consumers.

Consumer exposure to the risk of underutilisation is capped at a fixed, limited portion of the investment value. This limits their liability, relative to current arrangements, under the 'worst case' where utilisation is low. If the generation and transmission investments enabled though the speculative investment prove to be efficient and prudent, then consumers will benefit and these costs will effectively be passed through to them through the wholesale market

Government has the option of taking on some underutilisation risk by underwriting some portion of the capex for prescribed capacity.

### 8.4 NERA Economic Consulting's modelling of the benefits of introducing transmission access reform in the NEM has been published. What do you think about the modelling and assumptions used? What does this suggest about how fit-for-purpose the current access regime is? If you are unsure of the merits of locational marginal pricing and FTRs, what other suggestions would you make about how risks of congestion might be managed by generators?

See response to Question 5.

### 8.5 The AEMC has released an updated technical specification paper on the transmission access reform model, alongside this report. The updated proposal provides additional information on the options regarding the

**design of the instruments, pricing, and trading. How well do you think the proposal would address the identified challenges?**

As noted previously, a planning and investment framework is needed that delivers efficiency for strategic, whole-of-system investments to ensure the transformation to low-cost and zero-emissions sector is delivered in a timely and cost-effective manner.

PIAC is generally satisfied that the introduction of Locational Marginal Pricing (LMP) would improve locational signals for connecting generators and may create an incentive to generate at times to avoid local network congestion. We support further examination of possible price outcomes including the balance between allowing necessary signals for investment and preventing opportunities to systemically drive inefficiently high wholesale prices for consumers.

The case for Financial Transmission Rights (FTRs), however, is less clear. Given they are a financial instrument, it is not apparent how the proposed FTRs relate to network investment decisions. PIAC considers FTRs would only be in the interests of consumers to the extent they, in conjunction with the introduction of LMP, can help plan and deliver more effective generation and transmission investments.

Without a change to how network investment risks are allocated and costs are recovered, it is also not apparent how network investments driven by the sale of or payout from FTRs is in the long-term interests of consumers as opposed to the financial interests of FTR holders or the TNSP.

This is in contrast to other models, such as PIAC's risk- and cost-sharing model for REZs described previously, which can address the risk of inefficient congestion from expected future generation. Importantly, this model can drive prudent network investment to address congestion, rather than just hedging against the financial impact of congestion, and places the risk on parties best placed to manage them, as opposed to entirely with consumers.

PIAC's model involves pre-determining an 'efficient' capacity level for generation in the REZ. As noted in our response to Question 3, under the PIAC model, generators are protected from the risk of REZ underutilisation and timing misalignment between different generation projects. In lieu of bearing these risks, generators pay a rate of return premium to TNSPs, who bear some of the timing risk. Generators are incentivised to reduce this risk by connecting, or at least paying to connect, earlier.

### 8.6 What are stakeholder views on the current suite of locational investment signals? The ESB welcomes stakeholder views on alternative solutions to address the need for improved locational signalling for generators.

There is a difference between locational signals for investment and for operation. The two types of signals impact across different time scales and should be considered individually. Connecting parties are only exposed to some of the impacts (both positive and negative) of connecting to the network. Providing better signals would help align the optimal solution for them individually to the optimal solution for the system as a whole. There are a number of potential methods to do this.

For example, when a generator connects to the transmission network, there may be upgrades or reinforcement to the deeper network which is required to maintain system security or stability (i.e. deep connection assets). Under the current arrangements, these costs are socialised and recovered from consumers through the broader TUOS framework. Exposing generators to some or all of such costs would provide a more truly cost-reflective locational signal.

Another example is the use of MLF to provide a stronger, locational signal at the time of investment by reflecting the impact that each individual connecting party has on system-wide loss factors. Connecting parties could have their MLF 'locked in' by AEMO for a standard period of time – allowing the party greater certainty of its future revenue. If a new party were to connect nearby and affect the local MLF, this change would be borne by the second party alone rather than being spread across both parties.[17]

[17] These described further in PIAC, *Submission to Transmission Loss Factors rule change*, July 2019.